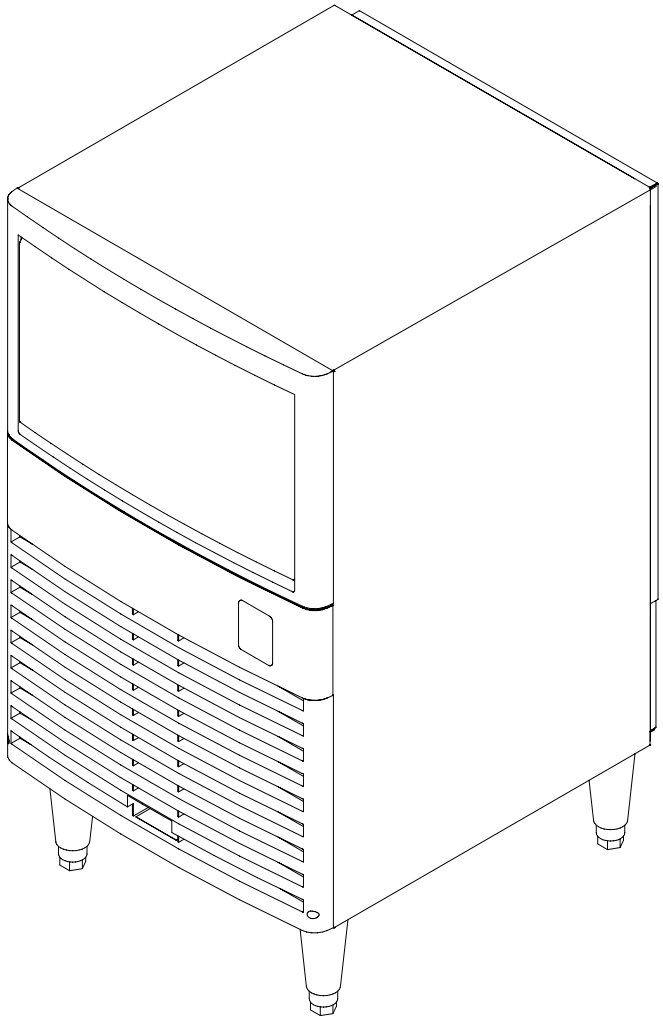
Manitowoc®



QM45 Series Ice Machines

Installation, Use, Care, and Service Manual

Thank you for selecting a Manitowoc Ice Machine, the dependability leader in ice making equipment and related products. With proper care and maintenance, your new Manitowoc Ice Machine will provide you with many years of reliable and economical performance.

We reserve the right to make product improvements at any time.
Specifications and design are subject to change without notice.

Part Number 000001774
10/06

Safety Notices

When using or servicing these Ice Machines, be sure to pay close attention to the safety notices in this manual. Disregarding the notices may lead to serious injury and/or damage to the ice machine.

Throughout this manual, you will see the following types of safety notices:

⚠ WARNING

Text in a Warning box alerts you to a potential personal injury situation. Be sure to read the Warning statement, and then proceed carefully.

⚠ CAUTION

Text in a Caution box alerts you to a situation in which you could damage the ice machine. Be sure to read the Caution statement, and then proceed carefully.

Procedural Notices

When using or servicing these Ice Machines, be sure to read the procedural notices in this manual. These notices supply helpful and important information.

Throughout this manual, you will see the following types of procedural notices:

Important

Important boxes serve two functions.

They call the operator's attention to important information.

They also provide the service technician with information that may help perform a procedure more efficiently. Disregarding this information may slow down the work.

NOTE: Text set off as a Note provides you with simple, but useful, extra information.

⚠ CAUTION

Proper care and maintenance are essential for maximum ice production and trouble-free operation of your Manitowoc Ice Machine.

Read and understand this manual. It contains valuable care and maintenance information. If you encounter problems not covered by this manual, feel free to contact Manitowoc Ice, Inc. We will be happy to provide assistance.

This manual covers the following model numbers:

Self-Contained Air-Cooled:

QM45A
QM45AE

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Section 1
General Information

Model Numbers

This manual covers the following models:

Self-Contained Air-Cooled	Voltage
QM45A	115/60/1
QM45AE	230/50/1

Accessories

Contact your Manitowoc distributor for these optional accessories:

ARCTICPURE WATER FILTER SYSTEM
Engineered specifically for Manitowoc ice machines, ArcticPure water filters are an efficient, dependable, and affordable method of inhibiting scale formation, filtering sediment, and removing chlorine taste and odor.

MANITOWOC CLEANER AND SANITIZER
Manitowoc Ice Machine Cleaner and Sanitizer are available in convenient 16 oz. (473 ml) and 1 gal (3.78 l) bottles. These are the only cleaner and sanitizer approved for use with Manitowoc products.

Cleaner Part Number		Sanitizer Part number	
16oz	94-0456-3	16oz	94-0565-3
1 Gallon	94-0580-3	1 Gallon	94-0581-3

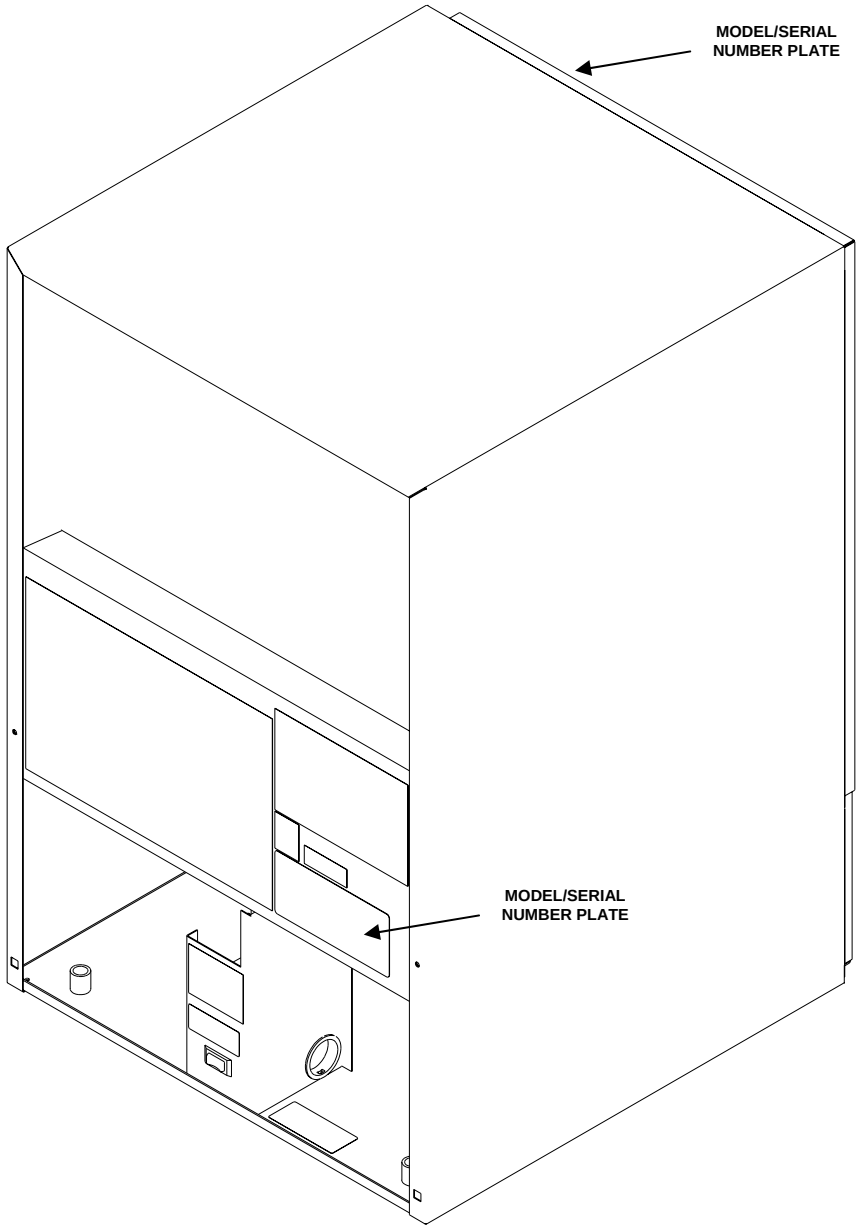
⚠Warning

PERSONAL INJURY POTENTIAL
Do not operate equipment that has been, misused, abused, neglected, damaged, or altered/modified from that of original manufactured specifications.

Model/Serial Number Location

Record the model and serial number of your ice machine in the space provided below. These numbers are required when requesting information from your local Manitowoc distributor, service representative, or Manitowoc Ice, Inc.

The model and serial number are listed on the OWNER WARRANTY REGISTRATION CARD. They are also listed on the MODEL/SERIAL NUMBER DECAL affixed to the ice machine.



Model/Serial Number Location

Ice Machine	
Model Number	
Serial Number	

Owner Warranty Registration Card

GENERAL

The packet containing this manual also includes warranty information. Warranty coverage begins the day your new ice machine is installed.

Important

Complete and mail the OWNER WARRANTY REGISTRATION CARD as soon as possible to validate the installation date.

If you do not return your OWNER WARRANTY REGISTRATION CARD, Manitowoc will use the date of sale to the Manitowoc Distributor as the first day of warranty coverage for your new ice machine.

Warranty Coverage

GENERAL

The following Warranty outline is provided for your convenience. For a detailed explanation, read the warranty bond shipped with each product.

Contact your local Manitowoc representative or Manitowoc Ice, Inc. if you need further warranty information.

Important

This product is intended exclusively for commercial application. No warranty is extended for personal, family, or household purposes.

PARTS

1. Manitowoc warrants the ice machine against defects in materials and workmanship, under normal use and service for three (3) years from the date of original installation.

LABOR

1. Labor required to repair or replace defective components is covered for three (3) years from the date of original installation.

EXCLUSIONS

The following items are not included in the ice machine's warranty coverage:

1. Normal maintenance, adjustments and cleaning as outlined in this manual.
2. Repairs due to unauthorized modifications to the ice machine or use of non-standard parts without prior written approval from Manitowoc Ice, Inc.
3. Damage caused by improper installation of the ice machine, electrical supply, water supply or drainage, or damage caused by floods, storms, or other acts of God.
4. Premium labor rates due to holidays, overtime, etc.; travel time; flat rate service call charges; mileage and miscellaneous tools and material charges not listed on the payment schedule. Additional labor charges resulting from the inaccessibility of equipment are also excluded.
5. Parts or assemblies subjected to misuse, abuse, neglect or accidents.
6. Damage or problems caused by installation, cleaning and/or maintenance procedures inconsistent with the technical instructions provided in this manual.
7. This product is intended exclusively for commercial application. No warranty is extended for personal, family, or household purposes.

AUTHORIZED WARRANTY SERVICE

To comply with the provisions of the warranty, a refrigeration service company qualified and authorized by your Manitowoc distributor, or a Contracted Service Representative must perform the warranty repair.

NOTE: If the dealer you purchased the ice machine from is not authorized to perform warranty service, contact your Manitowoc distributor or Manitowoc Ice, Inc. for the name of the nearest authorized service representative.

SERVICE CALLS

Normal maintenance, adjustments and cleaning as outlined in this manual are not covered by the warranty. If you have followed the procedures listed on page 5-1 of this manual, and the ice machine still does not perform properly, call your authorized service company.

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Section 2
Installation Instructions

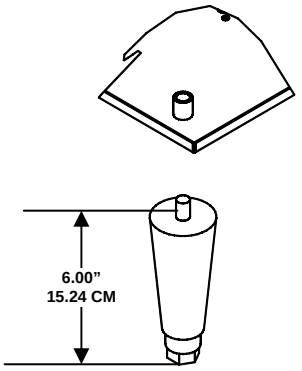
General

These instructions are provided to assist the qualified installer. Check your local Yellow Pages for the name of the nearest Manitowoc distributor, or call Manitowoc Ice, Inc. for information regarding start-up services.

Important
Failure to follow these installation guidelines may affect warranty coverage.

Ice Machine Dimensions

QM-45 ICE MACHINES



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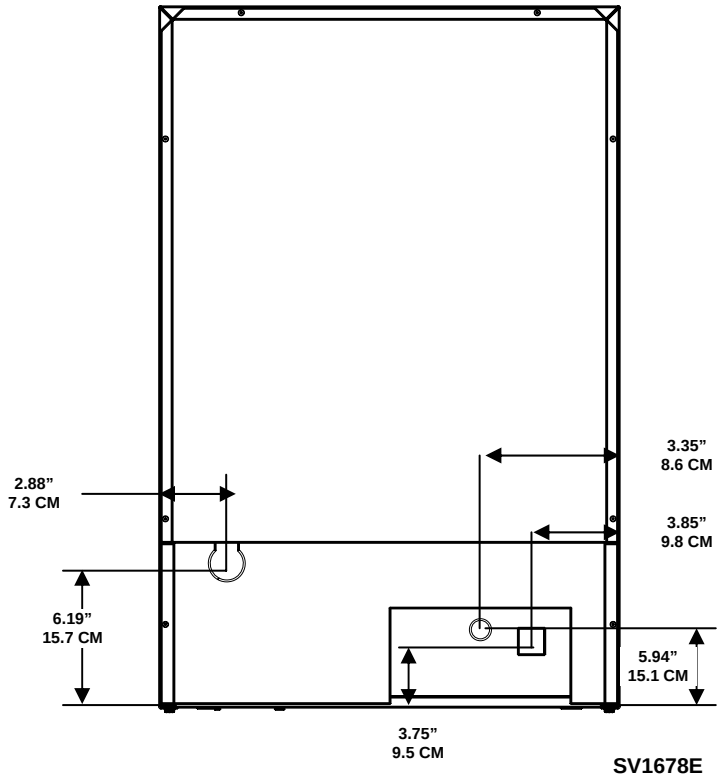

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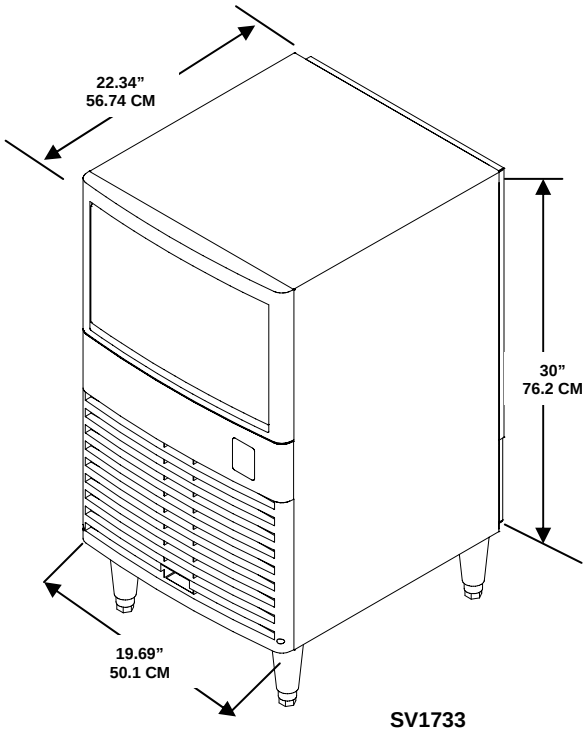

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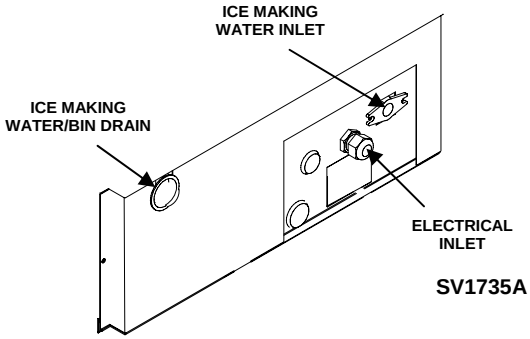

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Location of Ice Machine

The location selected for the ice machine must meet the following criteria. If any of these criteria are not met, select another location.

- The location must be indoors.
- The location must be free of airborne and other contaminants.
- The air temperature must be at least 35°F (1.6°C), but must not exceed 110°F (43.4°C).
- The location must not be near heat-generating equipment or in direct sunlight.
- The location must be capable of supporting the weight of the ice machine and a full bin of ice.
- The location must allow enough clearance for water, drain and electrical connections in the **rear of the ice machine.**
- The location must not obstruct airflow through or around the ice machine. Refer to the chart below for clearance requirements.

	Self-Contained Air-Cooled	Self-Contained Water-Cooled
Top/Sides	5" (203 mm)*	5" (127 mm)*
Back	5" (127 mm)*	5" (127 mm)*

NOTE: The ice machine may be built into a cabinet. There is no minimum clearance requirement for the top or left and right sides of the ice machine. The listed values are recommended for efficient operation and servicing only.

⚠ CAUTION

The ice machine must be protected if it will be subjected to temperatures below 32°F (0°C). Failure caused by exposure to freezing temperatures is not covered by the warranty.
See "Removal from Service/Winterization" on page 4-10.

Ice Machine Heat of Rejection

Series Ice Machine	Heat of Rejection* Air Conditioning**	Peak
QM-45	1750	2600

* B.T.U./Hour

** Because the heat of rejection varies during the ice making cycle, the figure shown is an average.

Ice machines, like other refrigeration equipment, reject heat through the condenser. It is helpful to know the amount of heat rejected by the ice machine when sizing air conditioning equipment where self-contained air-cooled ice machines are installed.

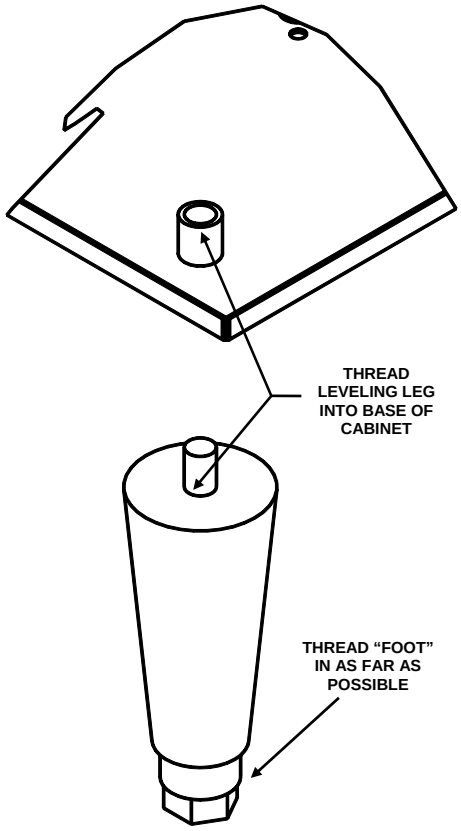
Leveling the Ice Machine

1. Screw the leveling legs onto the bottom of the ice machine.
2. Screw the foot of each leg in as far as possible.

⚠ CAUTION

The legs must be screwed in tightly to prevent them from bending.

3. Move the ice machine into its final position.
4. Level the ice machine to assure that the siphon system functions correctly. Use a level on top of the ice machine. Turn each foot as necessary to level the ice machine from front to back and side to side.



Leveling Leg and Foot

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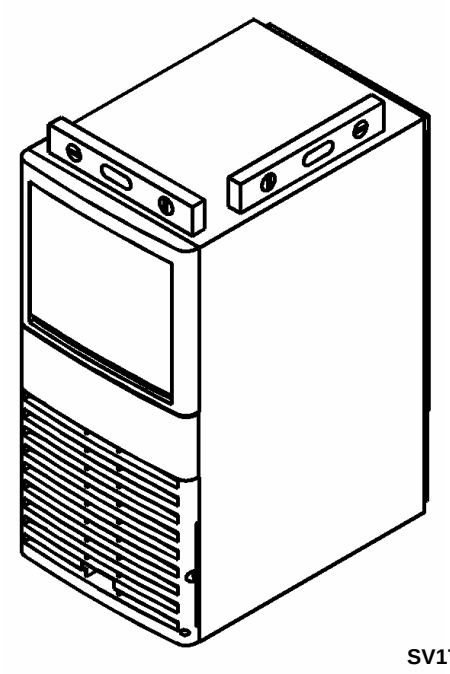
Important

Level the ice machine from front to back and side to side



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Checking Ice Machine Level

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Electrical Service

GENERAL

⚠ WARNING
All wiring must conform to local, state and national codes.

VOLTAGE
The maximum allowable voltage variation is ± 10% of the rated voltage on the ice machine model/serial number nameplate at start-up (when the electrical load is highest).

⚠ WARNING
The ice machine must be grounded in accordance with national and local electrical codes.

The 115/1/60 ice machines are factory pre-wired with a 6' power cord, and NEMA 5-20P-plug configuration.

The 230/50/1 ice machines are factory pre-wired with a 6' power cord only, no plug is supplied.

FUSE/CIRCUIT BREAKER
A separate fuse/circuit breaker must be provided for each ice machine. Circuit breakers must be H.A.C.R. rated (does not apply in Canada).

TOTAL CIRCUIT AMPACITY
The total circuit ampacity is used to help select the wire size of the electrical supply.

The wire size (or gauge) is also dependent upon location, materials used, length of run, etc., so it must be determined by a qualified electrician.

⚠ WARNING
Never use an extension cord. If an outlet is not within reach of the ice machine's power cord, have a proper amperage outlet wired closer to the ice machine.

QM-45 ICE MACHINE

Ice Machine	Voltage Phase Cycle	Air-Cooled	
		Maximum Fuse/Circuit Breaker	Total Amps
QM-45	115/1/60	15	5.2
	230/1/50	15	2.6

For United Kingdom Only

As the colours of the wires in the mains lead of the appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

- The wire which is coloured green and yellow must be connected to the terminal in the plug which is marked with the letter E or by the earth ground symbol ⏚ or coloured green or green and yellow.
- The wire coloured blue must be connected to the terminal which is marked with the letter N or coloured black.
- The wire coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

Water Service/Drains

WATER SUPPLY

Local water conditions may require treatment of the water to inhibit scale formation, filter sediment, remove chlorine, and improve taste and clarity.

Important

If you are installing a Manitowoc Tri-Liminator water filter system, refer to the Installation Instructions supplied with the filter system for ice making water inlet connections.

WATER INLET LINES

Follow these guidelines to install water inlet lines:

- Do not connect the ice machine to a hot water supply. Be sure all hot water restrictors installed for other equipment are working. (Check valves on sink faucets, dishwashers, etc.)
- If water pressure exceeds the maximum recommended pressure (80 psig), obtain a water pressure regulator from your Manitowoc distributor.
- Install a water shut-off valve for the ice making water line.
- Insulate water inlet line to prevent condensation.

DRAIN CONNECTIONS

Follow these guidelines when installing drain lines to prevent drain water from flowing back into the ice machine and storage bin:

- The ice machine comes equipped with a vinyl drain hose for use with floor drains.
- The floor drain must be large enough to accommodate drainage from all drains.
- Insulate the bin drain to prevent condensation.
- Drain lines must have a 1″ (2.5 cm) drop per 40″ (1 meter) of run, and must not create traps.

Important

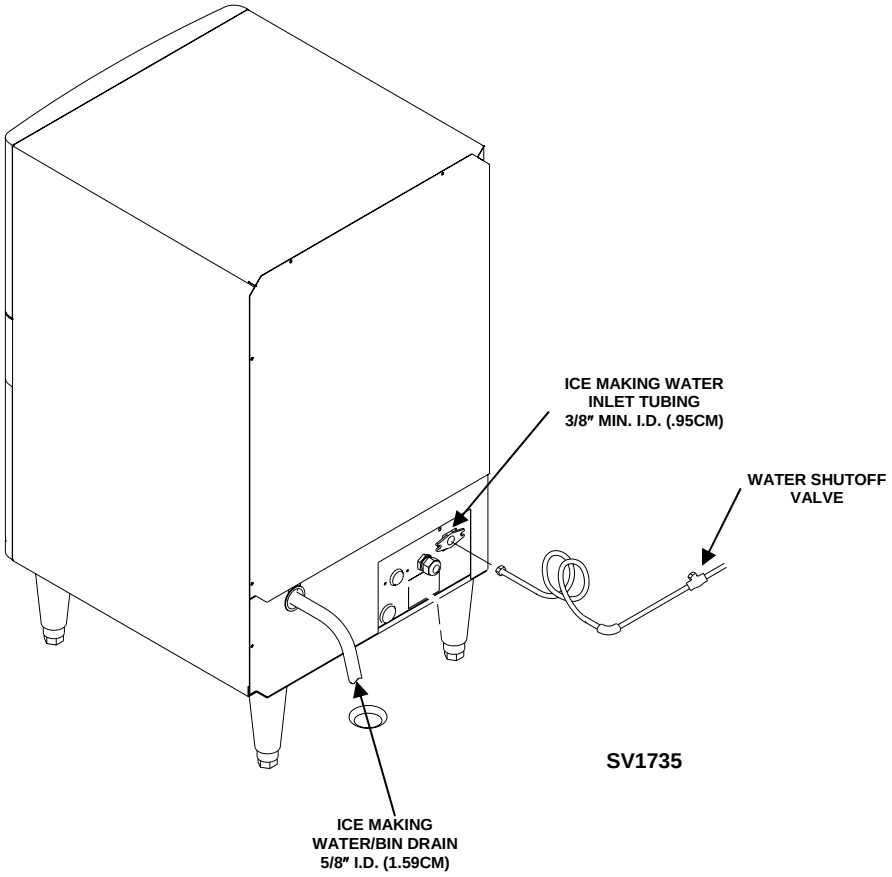
The Commonwealth of Massachusetts requires that all water-cooled models must be connected only to a closed loop, cooling tower system.

WATER SUPPLY AND DRAIN LINE SIZING/CONNECTIONS

⚠ CAUTION
Plumbing must conform to state and local codes.

Location	Water Temperature	Water Pressure	Ice Machine Fitting	Tubing Size Up to Ice Machine Fitting
Ice Making Water Inlet	33°F (0.6°C) Min. 90°F (32.2°C) Max.	20 psi (137.9 kPA) Min. 80 psi (551.5 kPA) Max.	3/8" Female Pipe Thread	3/8" (9.5 mm) minimum inside diameter
Bin Drain	---	---	3/4" (19.1 mm) Vinyl Tubing	N/A

Typical Water Supply Drain Installation



Installation Checklist

- ☐ Is the ice machine level?
- ☐ Has all of the internal packing been removed?
- ☐ Have all of the electrical and water connections been made?
- ☐ Has the supply voltage been tested and checked against the rating on the nameplate?
- ☐ Is there proper clearance around the ice machine for air circulation?
- ☐ Has the ice machine been installed where ambient temperatures will remain in the range of 35° - 110°F (1.7° - 43.3°C)?
- ☐ Has the ice machine been installed where the incoming water temperature will remain in the range of 33° - 90°F (0.6° - 32.2°C)?
- ☐ Are all electrical leads free from contact with refrigeration lines and moving equipment?
- ☐ Has the owner/operator been instructed regarding maintenance and the use of Manitowoc Cleaner and Sanitizer?
- ☐ Has the owner/operator completed the warranty registration card?
- ☐ Has the ice machine and bin been sanitized?
- ☐ Has this manual been given to the owner/operator?

Before Starting the Ice Machine

All Manitowoc ice machines are factory-operated and adjusted before shipment. Normally, new installations do not require any adjustment.

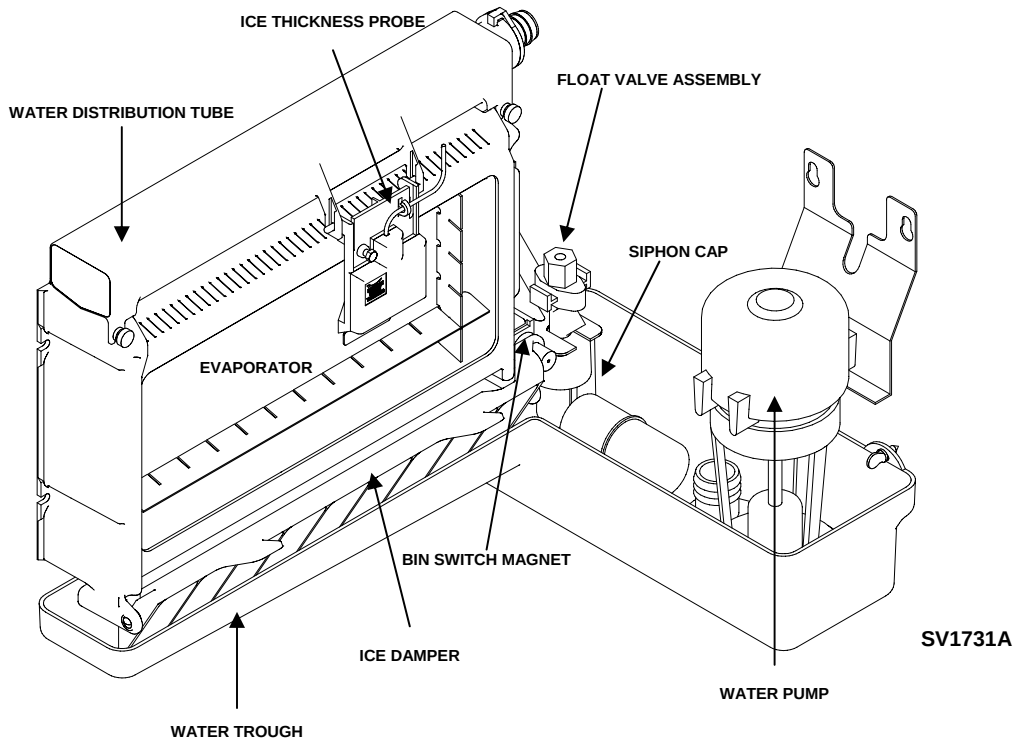
To ensure proper operation, follow the Operational Checks on page 3-4 of this manual. Starting the ice machine and completing the Operational Checks are the responsibilities of the owner/operator.

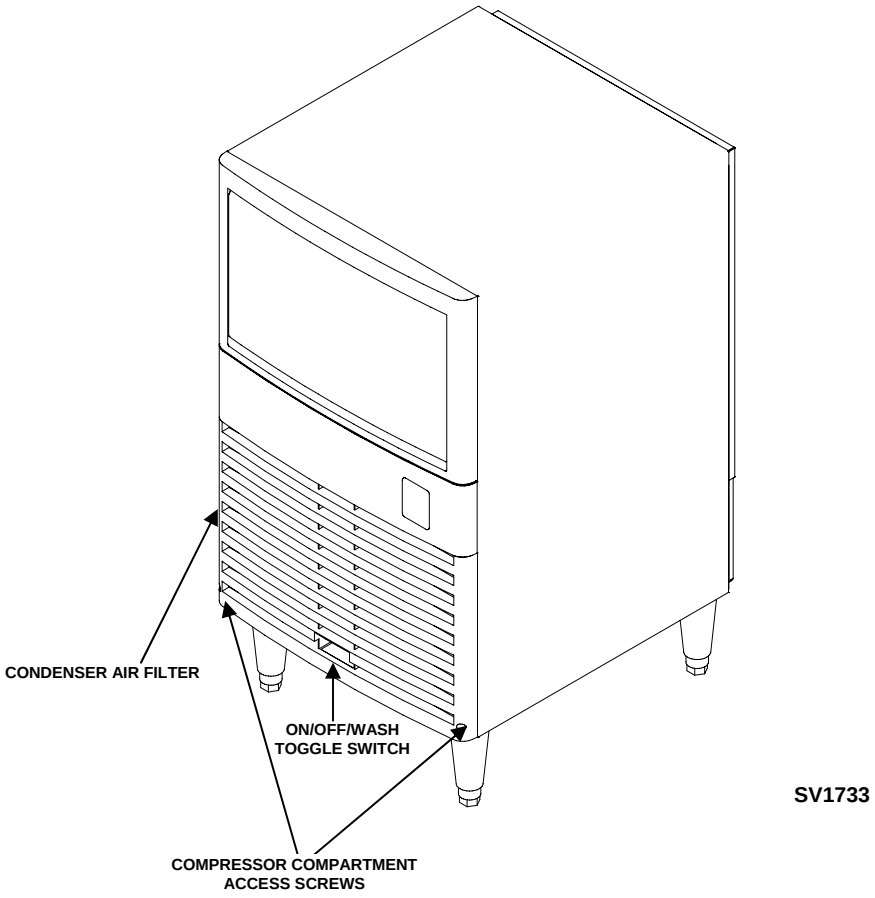
Adjustments and maintenance procedures outlined in this manual are not covered by the warranty.

⚠ WARNING
PERSONAL INJURY POTENTIAL
Do not operate equipment that has been misused, abused, neglected, damaged, or altered/modified from that of original manufactured specifications.

Ice Machine Operation

Component Identification





Ice Making Sequence of Operation

INITIAL START-UP OR START-UP AFTER AUTOMATIC SHUT-OFF

1. Pressure Equalization

Before the compressor starts the hot gas valve is energized for 15 seconds to equalize pressures during the initial refrigeration system start-up.

2. Refrigeration System Start-Up

The compressor starts after the 15-second pressure equalization, and remains on throughout the entire Freeze and Harvest Sequences. The hot gas valve remains on for 5 seconds during initial compressor start-up and then shuts off.

At the same time the compressor starts, the condenser fan motor (air-cooled models) is supplied with power throughout the entire Freeze and Harvest Sequences. The fan motor is wired through a fan cycle pressure control, therefore it may cycle on and off. (The compressor and condenser fan motor are wired through a relay. As a result, any time the relay coil is energized, the compressor and fan motor are supplied with power.)

FREEZE SEQUENCE

3. Prechill

The compressor is on for 30 seconds prior to water flow to Prechill the evaporator.

4. Freeze

The water pump starts after the 30-second Prechill. An even flow of water is directed across the evaporator and into each cube cell, where it freezes.

When sufficient ice has formed, the water flow (not the ice) contacts the ice thickness probe. After approximately 7 seconds of continual water contact, the Harvest Sequence is initiated. The ice machine cannot initiate a Harvest sequence until a 6-minute freeze lock has been surpassed.

HARVEST SEQUENCE

5. Harvest

The water pump de-energizes stopping flow over the evaporator. The rising level of water in the sump trough diverts water out of the over flow tube, purging excess minerals from the sump trough. The hot gas valve also opens to divert hot refrigerant gas into the evaporator.

The refrigerant gas warms the evaporator causing the cubes to slide, as a sheet, off the evaporator and into the storage bin. The sliding sheet of cubes contacts the ice damper, opening the bin switch.
The momentary opening and re-closing of the bin switch terminates the Harvest sequence and returns the ice machine to the Freeze Sequence (steps 3 - 4).

AUTOMATIC SHUT-OFF

7. Automatic Shut-Off

When the storage bin is full at the end of a Harvest sequence, the sheet of cubes fails to clear the ice damper and will hold it down. After the ice damper is held open for 7 seconds, the ice machine shuts off. The ice machine will remain off for 3 minutes before it can automatically restart.

The ice machine remains off until enough ice has been removed from the storage bin to allow the ice to fall clear of the damper. As the ice damper swings back to the operating position, the bin switch re-closes and the ice machine restarts (steps 1 - 2), provided the 3-minute delay period is complete.

QM45 SELF-CONTAINED AIR COOLED MODELS

ICE MAKING SEQUENCE OF OPERATION

	CONTROL BOARD RELAYS			RELAY		
	1	2	3	3A	3B *	LENGTH of "ON" TIME
	WATER PUMP	HOT GAS VALVE	RELAY COIL	COMPRESSOR	CONDENSER FAN MOTOR	
INITIAL START-UP/or START UP AFTER AUTO SHUT-OFF: **1. Pressure Equalization**	OFF	ON	OFF	OFF	OFF	*15 Seconds*
2. Refrigeration System Start-up	OFF	ON	ON	ON	ON	*5 Seconds*
FREEZE SEQUENCE: **3. Pre-Chill**	OFF	OFF	ON	ON	ON	*30 Seconds*
4. Freeze	ON	OFF	ON	ON	ON	*Until 7 sec. water contact with ice thickness probe*
HARVEST SEQUENCE: **5. Harvest**	OFF	ON	ON	ON	ON	*Bin switch activation*
6. AUTO SHUT-OFF	OFF	OFF	OFF	OFF	OFF	*Until bin switch re-closes*

Condenser Fan Motor: The fan motor is wired through a fan cycle pressure control, therefore, it may cycle on and off.

Operational Checks

GENERAL

Your Manitowoc ice machine was factory-operated and adjusted before shipment. Normally, a newly installed ice machine does not require any adjustment.

To ensure proper operation, always follow these Operational Checks when starting the ice machine:

- for the first time
- after a prolonged out of service period
- after cleaning and sanitizing

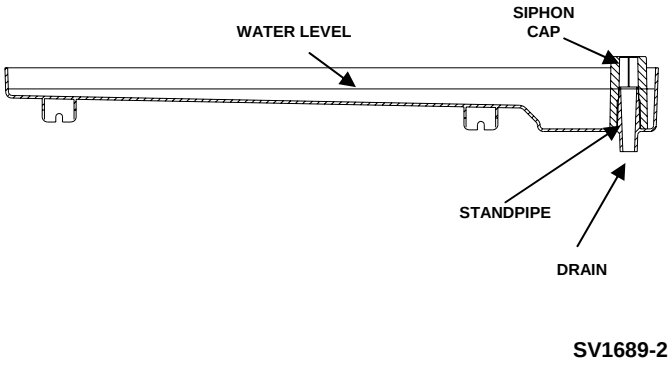
Routine adjustments and maintenance procedures outlined in this manual are not covered by the warranty.

SIPHON SYSTEM

To reduce mineral build-up and cleaning frequency, the water in the sump trough must be purged during each harvest cycle.
When the water pump de-energizes the level in the water trough rises above the standpipe starting a siphon action. The siphon action stops when the water level in the sump trough drops below the siphon cap. When the siphon action stops, the float valve refills the water trough to the correct level.

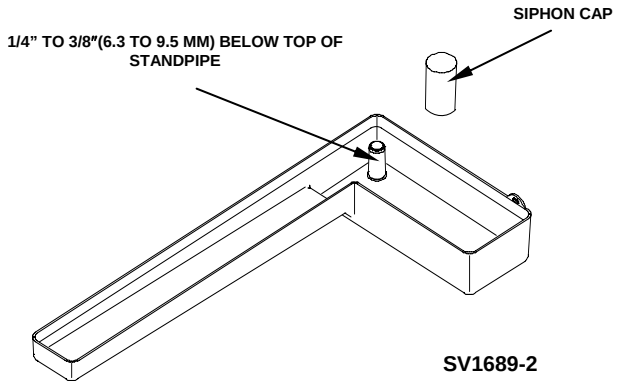
Siphon System Check

Follow steps 1 through 6 under water level check.



WATER LEVEL CHECK

Check the water level while the ice machine is in the clean mode and the water pump is running. The correct water level is 1/4" (6.3mm) to 3/8″ (9.5mm) below the top of the standpipe.



Water Level

The float valve is factory-set for the proper water level. If adjustments are necessary:

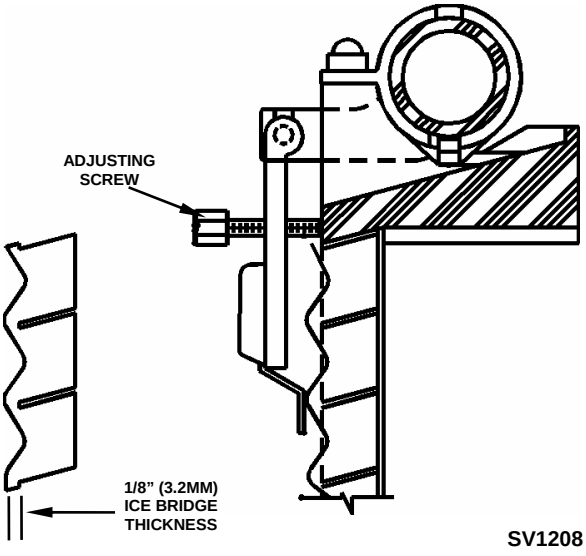
1. Verify the ice machine is level (see page 2-3).
2. Remove the siphon cap from the standpipe.
3. Place the main ICE/OFF/WASH toggle switch to the WASH position, and wait until the float valve stops adding water.
4. Adjust the water level to 1/4" (6.3mm) to 3/8" (9.5mm) below the standpipe:
   A Loosen the two screws on the float valve bracket.
   B Raise or lower the float valve assembly as necessary, then tighten the screws.
5. Move the main ICE/OFF/ WASH toggle switch to the OFF position. The water level in the trough will rise above the standpipe and run down the drain.
6. Replace the siphon cap on the standpipe, and verify water level and siphon action by repeating steps 3 through 5.

ICE THICKNESS CHECK

The ice thickness probe is factory-set to maintain the ice bridge thickness at 1/8” (3.2 mm).

1. Inspect the bridge connecting the cubes. It should be about 1/8” (3.2 mm) thick.
2. If adjustment is necessary, turn the ice thickness probe adjustment screw clockwise to increase bridge thickness, or counterclockwise to decrease bridge thickness.

NOTE: Turning the adjustment 1/3 of a turn will change the ice thickness about 1/16” (1.5 mm).



Ice Thickness Check

Make sure the ice thickness probe wire and the bracket do not restrict movement of the probe.

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Section 4
Maintenance

Interior Cleaning and Sanitizing

GENERAL

Clean and sanitize the ice machine every six months for efficient operation. If the ice machine requires more frequent cleaning and sanitizing, consult a qualified service company to test the water quality and recommend appropriate water treatment.

The ice machine must be taken apart for cleaning and sanitizing.

⚠ CAUTION

Use only Manitowoc approved Ice Machine Cleaner (part number 94-0546-3) and Sanitizer (part number 94-0565-3). It is a violation of Federal law to use these solutions in a manner inconsistent with their labeling. Read and understand all labels printed on bottles before use.

CLEANING AND SANITIZING PROCEDURE

⚠ CAUTION

Do not mix Ice Machine Cleaner and Sanitizer solutions together. It is a violation of Federal law to use these solutions in a manner inconsistent with their labeling.

⚠ WARNING

Wear rubber gloves and safety goggles (and/or face shield) when handling Ice Machine Cleaner or Sanitizer.

Ice machine cleaner is used to remove lime scale and mineral deposits. Ice machine sanitizer disinfects and removes algae and slime.

Step 1: Set the toggle switch to the OFF position after ice falls from the evaporator at the end of a Harvest cycle. Or, set the switch to the OFF position and allow the ice to melt off the evaporator.

⚠ CAUTION

Never use anything to force ice from the evaporator. Damage may result.

Step 2: Remove all ice from the bin.

Step 3: To start a cleaning cycle, move the toggle switch to the WASH position.

Step 4 Add the proper amount of Manitowoc Ice Machine Cleaner to the water trough.

Model	Amount of Cleaner
QM45	1.5 ounces (45 ml)

Step 5 Wait until the clean cycle is complete (approximately 22 minutes) then place the toggle switch in the OFF position, disconnect power and water supplies to the ice machine.

⚠ WARNING

Disconnect electric power to the ice machine at the electric switch box before proceeding.

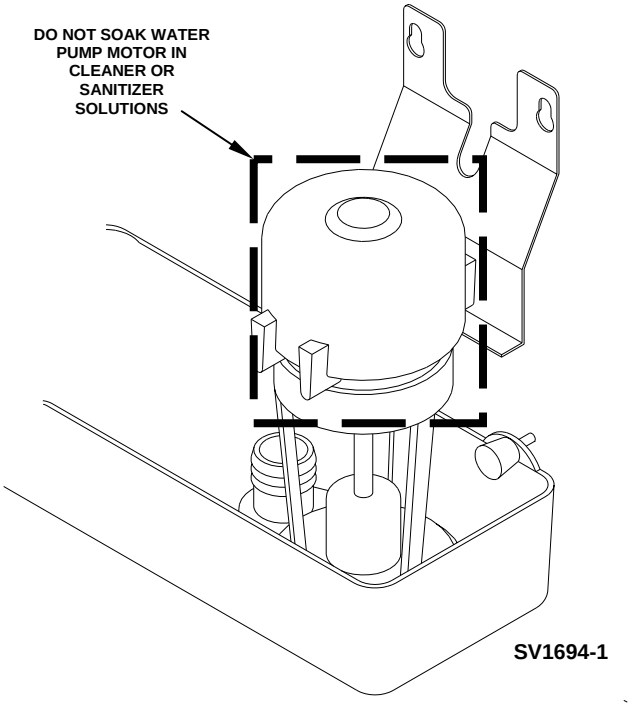
Step 6: Remove parts for cleaning.

A. Remove the Vinyl Hose

- Disconnect the water hose from the distribution tube and water pump.

B. Remove Water Pump

- Disconnect the water pump power cord

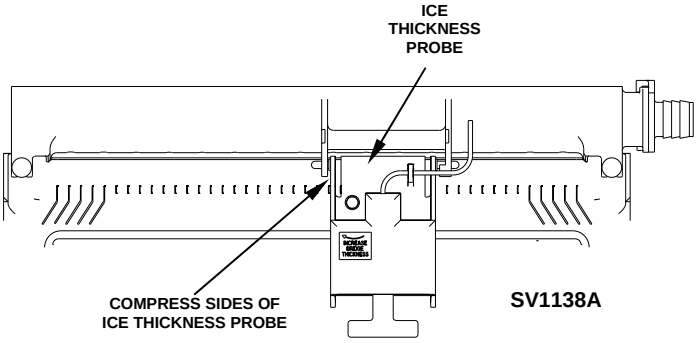


Water Pump Removal

- Loosen the screws securing the pump-mounting bracket to the bulkhead.
- Lift the pump and bracket assembly off the mounting screws.

C. Remove the Ice Thickness Probe

- Compress the side of the ice thickness probe near the top hinge pin and remove it from the bracket.



Ice Thickness Probe Removal

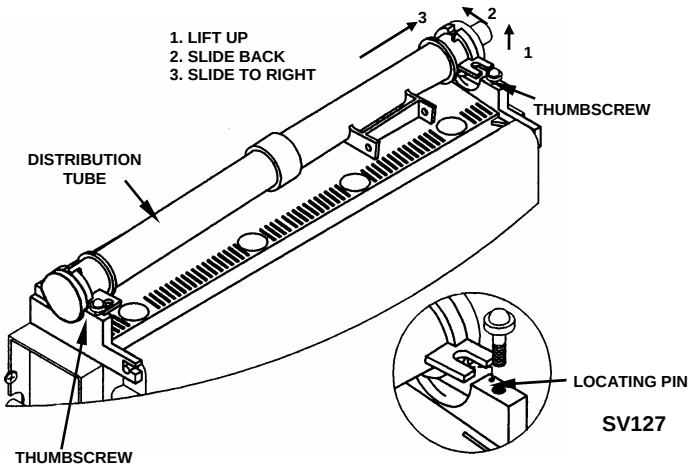
NOTE: At this point, the ice thickness probe can easily be cleaned. If complete removal is desired follow the ice thickness probe wire to the bulkhead grommet (exit point) in the back wall. Pop the bulkhead grommet out of the back wall by inserting fingernails or a flat object between the back wall and the grommet and prying forward. Pull the bulkhead grommet and wire forward until the connector is accessible, then disconnect the wire lead from the connector.

Ice Thickness Probe Cleaning

- Mix a solution of Manitowoc ice machine cleaner and water (2 ounces of cleaner to 16 ounces of water) in a container.
- Soak the ice thickness probe a minimum of 10 minutes.

Clean all ice thickness probe surfaces and verify the ice thickness probe cavity is clean. Rinse thoroughly with clean water, then dry completely. Incomplete rinsing and drying of the ice thickness probe can cause premature harvest.

D. Remove the Water Distribution Tube



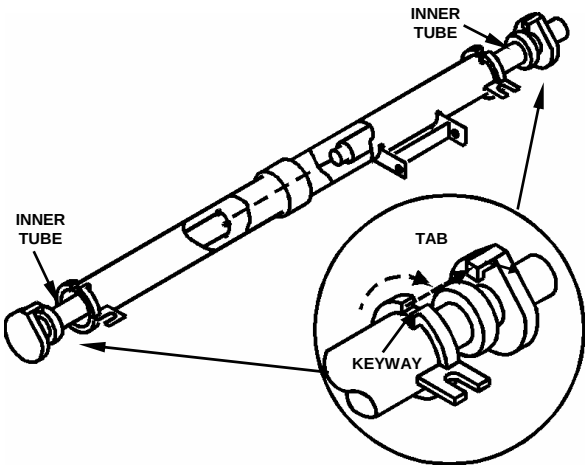
Water Distribution Tube Removal

- Loosen the two thumbscrews, which secure the distribution tube.
- Lift the right side of the distribution tube up off the locating pin, then slide it back and to the right.

> **⚠ CAUTION**
> Do not force this removal. Be sure the locating pin is clear of the hole before sliding the distribution tube out.

Disassembly

- Twist both of the inner tube ends until the tabs line up with the keyways.
- Pull the inner tube ends outward.

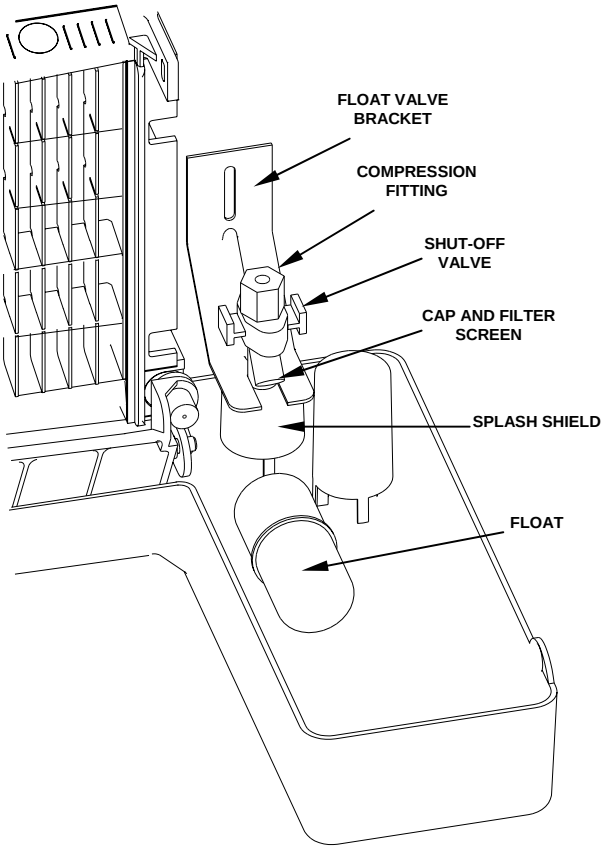


Water Distribution Tube Disassembly

SV1211

E. Remove the Float Valve

- Turn the splash shield counterclockwise one or two turns.



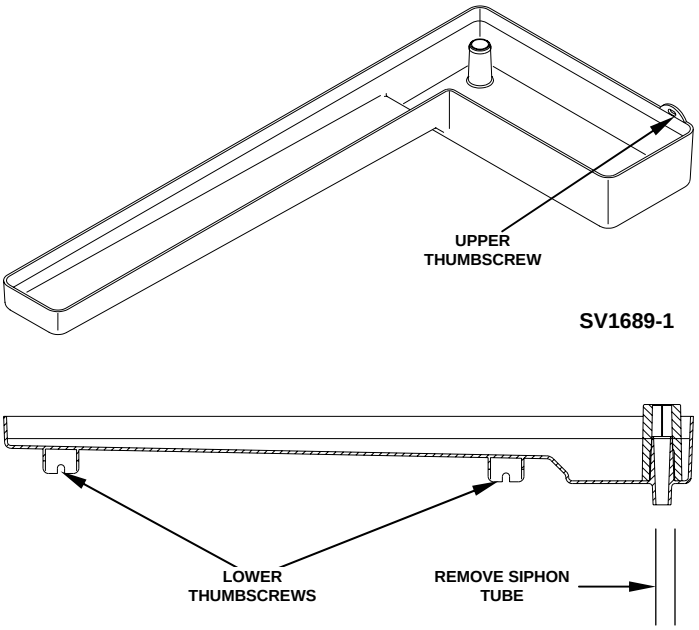
SV1695-2

Float Valve Removal

- Pull the float valve forward and off the mounting bracket.
- Disconnect the water inlet tube from the float valve at the compression fitting.
- Remove the cap and filter screen for cleaning.

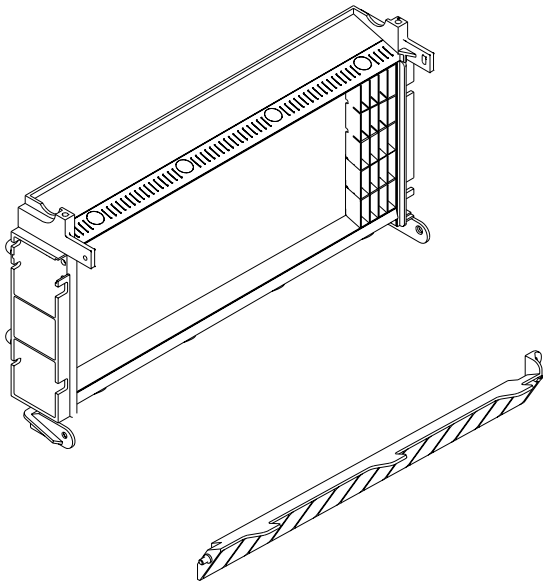
F. Remove the Water Trough

- Apply downward pressure on the siphon tube and remove from the bottom of the water trough.
- Remove the upper thumbscrew.
- While supporting the water trough remove the two thumbscrews from beneath the water trough.
- Remove the water trough from the bin area



G. Remove the Ice Damper

- Grasp ice damper and apply pressure toward the left hand mounting bracket.
- Apply pressure to the right hand mounting bracket with thumb.
- Pull ice damper forward when the right hand ice damper pin disengages.

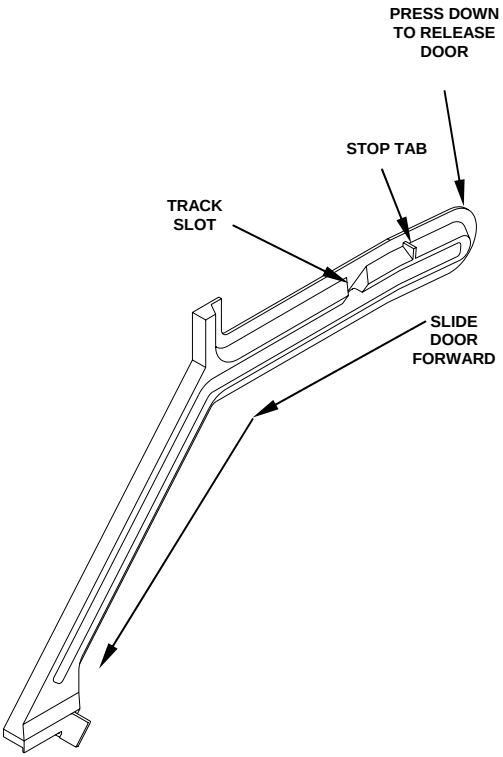


Installation

- Place ice damper pin in left hand mounting bracket and apply pressure toward the left hand mounting bracket.
- Apply pressure to the right hand mounting bracket with thumb.
- Push ice damper toward evaporator until right hand damper pin engages.

H. Remove the Bin Door

- Grasp the rear of the bin door and pull bin door forward approximately 5".
- Slide bin door to the rear while applying upward pressure (The rear door pins will ride up into the track slot and slide backward to the stop tab).
- While applying pressure against the bin door pull down on the rear of each bin door track until the door pins clear the stop tabs.
- Slide the rear door pins off the end and then below the door track. Slide bin door forward allowing the back of the door to lower into the bin. Continue forward with the bin door until the front pins bottom out in the track.
- Lift right side of door until the front pins clear the track, then remove door from bin.



Step 7 Mix a solution of cleaner and warm water. Depending on the amount of mineral buildup, a larger quantity of solution may be required. Use the ratio in the table below to mix enough solution to thoroughly clean all parts.

Solution Type	Water	Mixed with
Cleaner	1 gal. (4 l)	16 oz (500 ml) cleaner

Step 8 Use ½ of the cleaner/water solution to clean all components. The cleaner solution will foam when it contacts lime scale and mineral deposits; once the foaming stops use a soft bristle brush, sponge or cloth (not a wire brush) to carefully clean the parts. Soak the parts for 5 minutes (15 – 20 minutes for heavily scaled parts). Rinse all components with clean water.

Step 9 While components are soaking, use ½ of the cleaner/water solution to clean all foodzone surfaces of the ice machine and bin. Use a nylon brush or cloth to thoroughly clean the following ice machine areas:

- Evaporator plastic parts – including top, bottom and sides
- Bin bottom, sides and top

Rinse all areas thoroughly with clean water.

Step 10 Mix a solution of sanitizer and warm water.

Solution Type	Water	Mixed With
Sanitizer	6 gal. (23 l)	4 oz (120 ml) sanitizer

Step 11 Use 1/2 of the sanitizer/water solution to sanitize all removed components. Use a cloth or sponge to liberally apply the solution to all surfaces of the removed parts or soak the removed parts in the sanitizer/water solution. Do not rinse parts after sanitizing.

Step 12 Use 1/2 of the sanitizer/water solution to sanitize all foodzone surfaces of the ice machine and bin. Use a cloth or sponge to liberally apply the solution. When sanitizing, pay particular attention to the following areas:

- Evaporator plastic parts - including top, bottom and sides
- Bin bottom, sides and top

Do not rinse the sanitized areas.

Step 13 Replace all removed components.

Step 14 Reapply power and water to the ice machine and place the toggle switch in the WASH position.

Step 15 Add the proper amount of Manitowoc Ice Machine Sanitizer to the water trough.

Model	Amount of Sanitizer
QM45	1.5 ounces (45 ml)

Step16 Wait until the sanitize cycle is complete (approximately 22 minutes) then place the toggle switch in the OFF position, disconnect power and water supplies to the ice machine.

⚠ WARNING

Disconnect electric power to the ice machine at the electric switch box before proceeding.

Step 17 Repeat step 6 to remove parts for hand sanitizing.

Step 18 Mix a solution of sanitizer and warm water.

Solution Type	Water	Mixed With
Sanitizer	6 gal. (23 l)	4 oz (120 ml) sanitizer

Step 19 Use 1/2 of the sanitizer/water solution to sanitize all removed components. Use a cloth or sponge to liberally apply the solution to all surfaces of the removed parts or soak the removed parts in the sanitizer/water solution. Do not rinse parts after sanitizing.

Step 20 Use 1/2 of the sanitizer/water solution to sanitize all foodzone surfaces of the ice machine and bin. Use a cloth or sponge to liberally apply the solution. When sanitizing, pay particular attention to the following areas:

- Evaporator plastic parts - including top, bottom and sides
- Bin bottom, sides and top

Do not rinse the sanitized areas.

Step 21 Replace all removed components.

Step 22 Reapply power and water to the ice machine and place the toggle switch in the ICE position.

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ICE MACHINE INSPECTION

Check all water fittings and lines for leaks. Also, make sure the refrigeration tubing is not rubbing or vibrating against other tubing, panels, etc.

Do not put anything (boxes, etc.) in front of the ice machine. There must be adequate airflow through and around the ice machine to maximize ice production and ensure long component life.

EXTERIOR CLEANING

Clean the area around the ice machine as often as necessary to maintain cleanliness and efficient operation.

Sponge any dust and dirt off the outside of the ice machine with mild soap and water. Wipe dry with a clean, soft cloth.

A commercial grade stainless steel cleaner/polish can be used as necessary.

CLEANING THE CONDENSER

⚠ WARNING

Disconnect electric power to the ice machine at the electric service switch before cleaning the condenser.

Air-Cooled Condenser

A dirty condenser restricts airflow, resulting in excessively high operating temperatures. This reduces ice production and shortens component life. Clean the condenser at least every six months. Follow the steps below.

⚠ WARNING

The condenser fins are sharp. Use care when cleaning them.

1. The washable aluminum filter on self-contained ice machines is designed to catch dust, dirt, lint and grease. This helps keep the condenser clean. Clean the filter with a mild soap and water solution.
2. Clean the outside of the condenser with a soft brush or a vacuum with a brush attachment. Clean from top to bottom, not side to side. Be careful not to bend the condenser fins.
3. Shine a flashlight through the condenser to check for dirt between the fins. If dirt remains: Blow compressed air through the condenser fins from the inside. Be careful not to bend the fan blades.
4. Use a commercial condenser coil cleaner. Follow the directions and cautions supplied with the cleaner.
5. Straighten any bent condenser fins with a fin comb.
6. Carefully wipe off the fan blades and motor with a soft cloth. Do not bend the fan blades. If the fan blades are excessively dirty, wash with warm, soapy water and rinse thoroughly.

⚠ CAUTION

If you are cleaning the condenser fan blades with water, cover the fan motor to prevent water damage.

REMOVAL FROM SERVICE
WINTERIZATION

Special precautions must be taken if the ice machine is to be removed from service for an extended period of time or exposed to ambient temperatures of 32°F (0°C) or below.

> **⚠ CAUTION**
> If water is allowed to remain in the ice machine in freezing temperatures, severe damage to some components could result. Damage of this nature is not covered by the warranty.

Follow the applicable procedure below.

SELF-CONTAINED AIR-COOLED ICE MACHINES

1. Disconnect the electric power at the circuit breaker or the electric service switch.
2. Turn off the water supply.
3. Remove the water from the water trough.
4. Disconnect and drain the incoming ice-making water line at the rear of the ice machine.
5. Blow compressed air in both the incoming water and the drain openings in the rear of the ice machine until no more water comes out of the inlet water lines or the drain.
6. Make sure water is not trapped in any of the water lines, drain lines, distribution tubes, etc.

Section 5
Before Calling for Service

Checklist

If a problem arises during operation of your ice machine, follow the checklist below before calling for service. Routine adjustments and maintenance procedures are not covered by the warranty.

Problem	Possible Cause	To Correct
Ice machine does not operate.	No electrical power to the ice machine.	Replace the fuse/reset the breaker/turn on the main switch/plug power cord into receptacle.
	ON/OFF/ WASH toggle switch set improperly.	Move the toggle switch to the ON position.
	Damper in open position (down).	Damper must be capable of swinging freely. See page 6-2.
Ice machine stops, and can be restarted by moving the toggle switch to OFF and back to ICE.	Safety limit feature stopping the ice machine.	Refer to "Safety Limit Feature" on the next page.
Ice machine does not release ice or is slow to harvest.	Ice machine is dirty.	Clean and sanitize the ice machine. See pages 4-3 and 4-4.
	Ice machine is not level.	Level the ice machine. See page 2-3.
	Low air temperature around ice machine (air-cooled models).	Air temperature must be at least 35°F (1.6°C).
	Water regulating valve leaks in harvest mode (water-cooled models).	Replace water-regulating valve.
Ice machine does not cycle into harvest mode.	The six-minute freeze time lock-in has not expired yet.	Wait for freeze lock-in to expire.
	Ice thickness probe is dirty.	Clean and sanitize the ice machine. See pages 4-3 and 4-4.
	Ice thickness probe wire is disconnected.	Connect the wire.
	Ice thickness probe is out of adjustment.	Adjust the ice thickness probe. See page 3-5.
	Uneven ice fill (thin at top of evaporator).	See "Shallow or Incomplete Cubes" on the next page.
Ice quality is poor (soft or not clear).	Poor incoming water quality.	Contact a qualified service company to test the quality of the incoming water and make appropriate filter recommendations.
	Water filtration is poor.	Replace the filter.
	Ice machine is dirty.	Clean and sanitize the ice machine. See pages 4-3 and 4-4.
	Water siphon is not working.	Check the water siphon system. See page 3-4.
	Water softener is working improperly (if applicable).	Repair the water softener.

Continued on next page...

Problem	Possible Cause	To Correct
Ice machine produces shallow or incomplete cubes, or the ice fill pattern on the evaporator is incomplete.	Ice thickness probe is out of adjustment.	Adjust the ice thickness probe. See page 3-5.
	Water trough level is to high or too low.	Check the water level. See page 3-4.
	Water float valve filter screen is dirty.	Remove and clean the filter screen. See page 4-1.
	Water filtration is poor.	Replace the filter.
	Hot incoming water.	Connect the ice machine to a cold water supply. See page 2-6.
	Water float valve is not working.	Remove the water float valve and clean it. See page 4-7.
	Incorrect incoming water pressure.	Water pressure must be 20-80 psi (137.9 - 551.5 kPA).
	Ice machine is not level.	Level the ice machine. See page 2-3.
Low ice capacity.	Water float valve filter screen is dirty.	Remove and clean the filter screen. See page 4-1.
	Incoming water supply is shut off.	Open the water supply valve.
	Water float valve stuck open or leaking.	Remove the water float valve and clean it. See page 4-7.
	The condenser is dirty.	Clean the condenser. See page 4-1.
	High air temperature around ice machine (air-cooled models).	Air temperature must not exceed 110°F (43.3°C).
	Inadequate clearance in front of the ice machine.	Provide adequate clearance. See page 2-2.
	Objects stacked around ice machine, blocking airflow to condenser (air-cooled models).	Remove items blocking airflow.

Safety Limit Feature

In addition to the standard safety controls, your Manitowoc ice machine features built-in safety limits that will stop the ice machine if conditions arise which could cause a major component failure.

Before calling for service, re-start the ice machine using the following procedure:

1. Move the ON/OFF/ WASH switch to OFF and then back to ON.
   A. If the safety limit feature has stopped the ice machine, it will restart after a short delay. Proceed to step 2.
   B. If the ice machine does not restart, see “Ice machine does not operate” on the previous page.
2. Allow the ice machine to run to determine if the condition is reoccurring.
   A. If the ice machine stops again, the condition has reoccurred. Call for service.
   B. If the ice machine continues to run, the condition has corrected itself. Allow the ice machine to continue running.

SAFETY LIMITS

General

In addition to standard safety controls, the control board has two built in safety limit controls which protect the ice machine from major component failures.

Safety Limit #1: If the freeze time reaches 60 minutes, the control board automatically initiates a harvest cycle. If three consecutive 60-minute freeze cycles occur, the ice machine stops.

Safety Limit #2: If the harvest time reaches 3.5 minutes, the control board automatically returns the ice machine to the freeze cycle. If three consecutive 3.5 minute harvest cycles occur, the ice machine stops.

Safety Limit Stand-By Mode:
The first time a safety limit shut down occurs, the ice machine turns off for 60 minutes (Stand-by Mode). The ice machine will then automatically restart to see if the problem reoccurs. During the Stand-By Mode the harvest light will be flashing continuously and a safety limit indication can be viewed. If the same safety limit is reached a second time (the problem has re-occurred) the ice machine will initiate a safety limit shut down and remain off until it is manually restarted. During a safety limit shut down the harvest light will be flashing continuously.

Determining Which Safety Limit Stopped The Ice Machine

When a safety limit condition causes the ice machine to stop, the harvest light on the control board continually flashes on and off. Use the following procedures to determine which safety limit has stopped the ice machine.

1. Move the toggle switch to OFF.
2. Move the toggle switch back to ON.
3. Watch the harvest light. It will flash one or two times, corresponding to safety limits 1 and 2, to indicate which safety limit stopped the ice machine.

After safety limit indication, the ice machine will restart and run until a safety limit is exceeded again.

Safety Limit Notes

- A safety limit indication is completed before the water pump starts. Water contacting the ice thickness probe in the freeze cycle will cause the harvest light to flash. Do not mistake a harvest light flashing in the freeze cycle with a safety limit indication.
- A continuous run of 100 harvests automatically erases the safety limit code.
- The control board will store and indicate only one safety limit – the last one exceeded.
- If the toggle switch is moved to the OFF position and then back to the ICE position prior to reaching the 100-harvest point, the last safety limit exceeded will be indicated.
- If the harvest light did not flash prior to the ice machine restarting, then the ice machine did not stop because it exceeded a safety limit.

Safety Limit #1
Freeze time exceeds 60 minutes for 3 consecutive freeze cycles.

Possible Cause	Check/Correct
Improper installation	• See "Installation Instructions" Section two of this manual
Water system	• Low water pressure (20 psi minimum.) • High water pressure (80 psi maximum.) • High water temperature (90°F/32.2°C maximum.) • Clogged water distribution tube • Dirty/defective water float valve • Loss of water from sump area • Defective water pump
Electrical system	• Ice thickness probe out of adjustment • Harvest cycle not initiated electrically • Relay not energizing • Compressor electrically non-operational
Restricted condenser air flow (air-cooled models)	• High inlet air temperature (110°F/43.3°C maximum.) • Condenser discharge air recirculation • Dirty condenser filter • Dirty condenser fins • Defective fan cycling control • Defective fan motor
Refrigeration system	• Non-Manitowoc components • Improper refrigerant charge • Defective hot gas valve • Defective compressor • TXV starving or flooding (check insulation and bulb mounting) • Non-condensables in refrigeration system • Plugged or restricted high side refrigerant lines or component

Safety Limit #2
Harvest time exceeds 3.5 minutes for 3 consecutive harvest cycles.

Possible Cause	Check/Correct
Improper installation	• See "Installation Instructions" Section two of this manual
Water system	• Water area (evaporator) dirty • Water freezing behind evaporator • Low water pressure (20 psi min.) • Loss of water from sump area • Clogged water distribution tube • Dirty/defective water float valve • Defective water pump
Electrical system	• Ice thickness probe out of adjustment • Ice thickness probe dirty • Bin switch defective • Premature harvest
Refrigeration system	• Non-Manitowoc components • Improper refrigerant charge • Defective hot gas valve • TXV flooding (check insulation and bulb mounting) • Defective fan cycling control

Because there are many possible external problems,
do not limit your diagnosis to only the items listed in these charts.

EC DECLARATION OF CONFORMTIY

We hereby declare that our products, ice machines and Multiplex refrigeration equipment comply with all the essential requirements of the listed EC - directives.

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Manitowoc, Wisconsin 54221-1720 USA

European Distributor:

Representative of Manitowoc Ice, Inc.:

Engineering Manager. (Printed name)

Signature

Representative of European Distributor:

Model and Serial No.

Applied EC Directives:

Low Voltage 73/23/EEC
EMC 89/336/EEC
Pressure Equipment 97/23/EC

Applied Standards:

EN60335-1 Safety of household and similar electrical appliances
EN60335-2-24 Particular requirements refrigerators, food freezers and ice makers

EN55014 Electrical Motor Operated Appliances (Emissions)
EN55104 Electro Magnetic Compatability (Immunity)
EN378 -1 to -4 Refrigeration Plants

CE **

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